

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
30 October 2003 (30.10.2003)

PCT

(10) International Publication Number  
**WO 03/090207 A1**(51) International Patent Classification<sup>7</sup>: **G10L 19/02**(21) International Application Number: **PCT/IB03/01591**(22) International Filing Date: **22 April 2003 (22.04.2003)**(25) Filing Language: **English**(26) Publication Language: **English**(30) Priority Data:  
02076588.9 22 April 2002 (22.04.2002) EP  
02077869.2 16 July 2002 (16.07.2002) EP(71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL];  
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

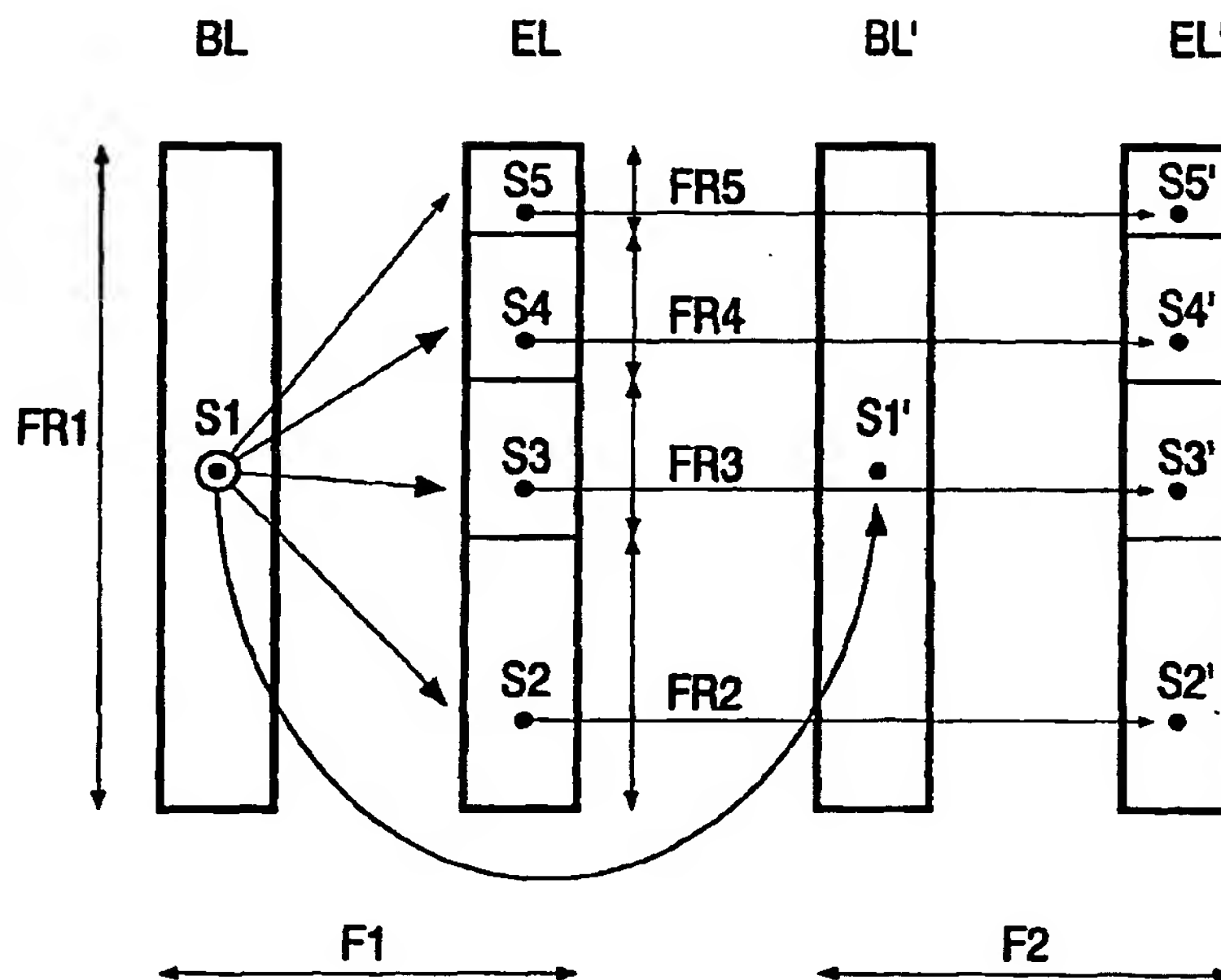
(72) Inventors; and

(75) Inventors/Applicants (for US only): **DOMEN, Arnoldus W., J.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **SCHUIJERS, Erik, G., P.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).**BREEBAART, Dirk, J.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **VAN DE PAR, Steven, L., J., D., E.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).(74) Agent: **GROENENDAAL, Antonius, W., M.**; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

[Continued on next page]

(54) Title: **PARAMETRIC MULTI-CHANNEL AUDIO REPRESENTATION**

(57) Abstract: Multi-channel audio signals are coded into a monaural audio signal and information allowing to recover the multi-channel audio signal from the monaural audio signal and the information. The information is generated by determining a first portion of the information for a first frequency region of the multi-channel audio signal, and by determining a second portion of the information for a second frequency region of the multi-channel audio signal. The second frequency region is a portion of the first frequency region and thus is a sub-range of the first frequency region. The information is multi-layered enabling a scaling of the decoding quality versus bit rate.

WO 03/090207 A1



SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *with international search report*

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB 03/01591

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G10L19/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G10L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, INSPEC, IBM-TDB, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	VAN DER WAAL R G ET AL: "Subband coding of stereophonic digital audio signals" SPEECH PROCESSING 2, VLSI, UNDERWATER SIGNAL PROCESSING. TORONTO, MAY 14 - 17, 1991, INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH & SIGNAL PROCESSING. ICASSP, NEW YORK, IEEE, US, vol. 2 CONF. 16, 14 April 1991 (1991-04-14), pages 3601-3604, XP010043648 ISBN: 0-7803-0003-3 abstract page 3602, right-hand column, line 10 -page 3603, right-hand column, line 29 page 3604, left-hand column, line 29 -right-hand column, line 2	1-7,10, 13-21
A	---	8,9,11, 12
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

4 August 2003

Date of mailing of the international search report

11/08/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel (+31-70) 340-2040, Tx 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Zimmermann, E

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB 03/01591

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FALLER C ET AL: "Efficient representation of spatial audio using perceptual parametrization" IEEE WORKSHOP ON APPLICATIONS OF SIGNAL PROCESSING TO AUDIO AND ACOUSTICS, XX, XX, 21 October 2001 (2001-10-21), pages 199-202, XP002245584 abstract page 201, right-hand column, line 3 - line 22	1-21
A	BOSI M ET AL: "ISO/IEC MPEG-2 ADVANCED AUDIO CODING" JOURNAL OF THE AUDIO ENGINEERING SOCIETY, AUDIO ENGINEERING SOCIETY. NEW YORK, US, vol. 45, no. 10, 1 October 1997 (1997-10-01), pages 789-812, XP000730161 ISSN: 0004-7554 page 806, left-hand column, line 5 -right-hand column, line 41	1-21
A	EP 1 107 232 A (LUCENT TECHNOLOGIES INC) 13 June 2001 (2001-06-13) cited in the application abstract page 3, line 34 - line 53	1-21
A	US 5 890 125 A (DAVIS MARK FRANKLIN ET AL) 30 March 1999 (1999-03-30) abstract; figure 1 column 4, line 19 - line 33	1-21

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IB 03/01591

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1107232	A	13-06-2001	US 6539357 B1 25-03-2003
		CA 2326495 A1 03-06-2001	
		EP 1107232 A2 13-06-2001	
		JP 2001209399 A 03-08-2001	
US 5890125	A	30-03-1999	AT 215295 T 15-04-2002
		AU 746416 B2 02-05-2002	
		AU 8138098 A 10-02-1999	
		CN 1264533 T 23-08-2000	
		DE 69804478 D1 02-05-2002	
		DE 69804478 T2 02-10-2002	
		DK 1016320 T3 08-07-2002	
		EP 1016320 A2 05-07-2000	
		ES 2171031 T3 16-08-2002	
		JP 2001510953 T 07-08-2001	
		WO 9904498 A2 28-01-1999	